NovelSat
Making Space in Space

Satellite IP Trunking
European Mobile Operator Saves on African Links

The NovelSat solution for IP trunking, based on NovelSat NS3000 modems, reduced bandwidth usage from 97MHz to 19MHz.
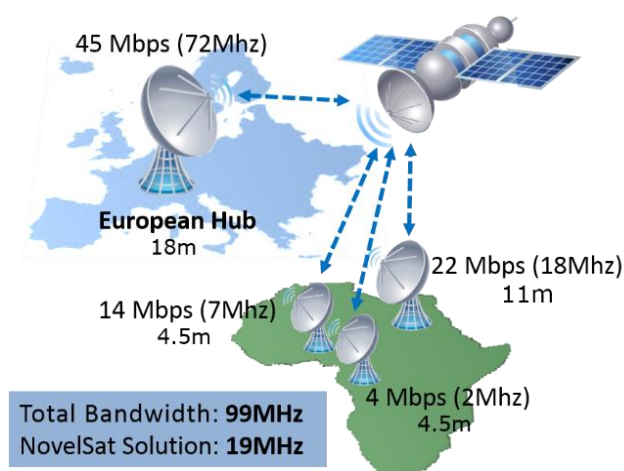
Challenge

A major European mobile operator with growing interests in Africa wanted to find ways to reduce satellite bandwidth costs as much as possible for a point-to-point IP trunking network between a European hub and a number of terminals with various sized antennas in Africa.

Goal

Based on spectral efficiency, select the satellite transmission solution that would deliver the best ROI.

45 Mbps (72Mhz)

European Hub
18m

22 Mbps (18Mhz)
11m

14 Mbps (7Mhz)
4.5m

4 Mbps (2Mhz)
4.5m

Total Bandwidth: **99MHz**
NovelSat Solution: **19MHz**

Background

Africa has the world's highest growth rates in mobile broadband with penetration increasing from 2% in 2010 to 11% in 2013 according to the ITU. Global mobile operators, competing for their share of this burgeoning market also understand that data services need to be priced effectively to attract African customers. Adding to the normal cost of data transmission, however, Africa poses additional challenges for operators, not least of which is the high cost of satellite bandwidth required to reach many remote and harsh areas of Africa.

In this case, the mobile operator made the obvious choice of seeking ways to reduce satellite bandwidth costs to profitably meet the growing data demands. In their first round of tests, they compared satellite transmission solutions from some of the leading providers, including NovelSat. The tests covered three bi-directional data links in Africa using 4.5m and 11m antennas and a hub with an 18m antenna in their European network operations footprint.

Total bandwidth in the existing solution was 99MHz (72MHz outbound and 27MHz inbound) with C Band transmission over bandwidth on an Intelsat 702 satellite in an inclined orbit.

Solution

NovelSat NS3000 Professional Satellite Modems, running advanced spectral performance enhancing features, reduced total system bandwidth utilization by more than 80%, from 97MHz to just 19MHz. NovelSat competed head to head with technologies from other vendors. The nearest competitor required 83% more bandwidth to deliver the bi-directional traffic load demanded by the customer. This level of spectral efficiency translates into savings of nearly 1 million dollars annually assuming the cost of 1MHz per Month is $1K.

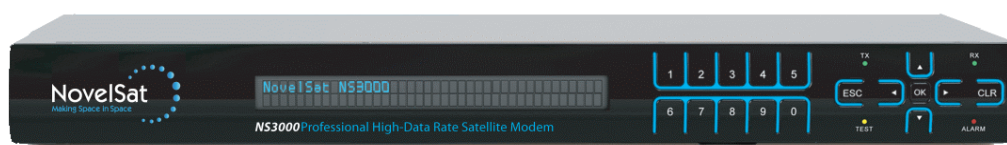| Original System Bandwidth	97MHz
NovelSat Solution	19MHz
Total Saved Bandwidth	80MHz
Annual Savings (Inclined Orbit 1MHz/Month = $1K)	$960K
Annual Savings (Regular Orbit 1MHz/Month = $3K)	$2.9M
ROI	12 Days

Technology

The NovelSat NS3000 Professional Satellite Modems used in this solution can support all major satellite transmission industry standards, including DVB-S and DVB-S2. However, to deliver the spectral efficiency demanded by this IP trunking solution, the customer chose to use the NovelSat NS3 high-end efficiency satellite transmission software package. NovelSat NS3 typically delivers more than 30% more capacity per MHz of bandwidth compared with industry standard DVB-S2 technology. In this case, efficiency increased by 80% vs. the installed DVB-S2 based solution.

The solution also included NovelSat DUET™ CeC™ (Carrier-echo-Cancellation) technology which doubles the capacity of each satellite carrier by simultaneously reusing outbound bandwidth for inbound traffic, enabling full multiplexed bi-directional transmission. This was a critical factor in reducing the bandwidth requirement. Advanced AUPC (Automatic Uplink Power Control) was also used to automatically adjust power to compensate for uplink fade, effectively adding around 2dB to the link margin. The NovelSat NS3000 modems also ran ACM (Adaptive Coding and Modulation) for intelligent management of fade margin, especially valuable where weather fluctuations can effect signal resilience.

These and many other features are built-in software defined options available on all NovelSat modems and conveniently require no additional hardware for their implementation. In fact all NovelSat options can be implemented Over-the-Air (OTA) using the satellite link – a critical element for remote terminal operation and maintenance.

All NovelSat satellite transmission products are built around NovelSat SMOS (Satellite Modem Operating System), a unified satellite communications platform that ensures optimal interoperability, throughput and scalability of capacity, software-upgradable high-end features and waveforms. The NovelSat NS3000 modem powers the satellite industry's most scalable point-to-point and point-to-multipoint transmission applications, enabling applications from 64Kbps to 425Mbps on a single carrier.

NovelSat NS3000 Professional Satellite Modem